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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,849	02/09/2004	Haixin Yang	EL0543USNA	1160

23906 7590 04/10/2007

E I DU PONT DE NEMOURS AND COMPANY
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EXAMINER	
MAYES, MELVIN C	
ART UNIT	PAPER NUMBER
1734	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,849	YANG, HAIXIN	
	Examiner	Art Unit	
	Melvin Curtis Mayes	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 2* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/24/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

(1)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(2)

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-260664 in view of Loria et al. 5,443,628.

JP 11-260664 (JP '664) disclose a method of making a multilayer chip component comprising: ink jet printing internal electrodes on green sheets; laminating the green sheets; and firing. The ink jet printing ink comprises electrode material powder (conductor functional material), binder and solvent and has a viscosity of 10 cP (10 mPas) (computer translation). JP '664 does not specifically disclose polyvinylpyrrolidone as the binder.

Loria et al. teach that for ink jet compositions for printing on substrates to be subjected to high temperatures after being printed, such as ceramic articles, the ink jet composition comprises a carrier solvent and a binder resin to add adhesion of the ink droplet to the substrate and has a viscosity of 1-10 centipoises at 25°C (1-10 mPas). The binder resin is organic resin commonly used in ink jet printer ink compositions and include acrylic copolymers, silicone resins, rosin esters, polyvinyl esters, ketone resin, polyamide resin, polyvinylpyrrolidone resins, vinyl pyrrolidone/vinyl acetate copolymers, etc. (col. 2, lines 14-25, col. 4, lines 20-35).

It would have been obvious to one of ordinary skill in the art to have provided the binder in the ink jet printing ink used in the method of JP '664 as polyvinylpyrrolidone, as taught by Loria et al., as a binder resin commonly used in ink jet compositions and which can be used in ink jet compositions for printing on ceramic substrates to be subjected to high temperatures after being printed. The use of any of the commonly used binder resins such as polyvinylpyrrolidone resins would have been obvious to one of ordinary skill in the art, as taught by Loria et al.

JP '664 discloses providing the ink jet printing ink of viscosity of 10 mPas, thus encompassed by the claimed viscosity range of 5-50 mPas at 25 to 35°C. Further, providing the ink of viscosity of 1-10 mPas at 25°C, thus overlapping the claimed range of 5-50 mPas, would have been obvious to one of ordinary skill in the art, as taught by Loria et al., as viscosity suitable for ink jet composition for printing on ceramic to be subsequently fired.

(3)

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-182889 in view of either Loria et al. 5,443,628 or Zhu 5,889,083.

JP 2000-182889 (JP '889) disclose a method of making a laminate ceramic electronic component comprising: ink jet printing conductive electrode patterns on green sheets; laminating the green sheets; and firing. The ink jet ink comprises electrode metal powder (conductor functional material), resin and organic solvent or water. JP '889 discloses adjusting the viscosity of the ink to a viscosity of 0.1-0.5 poise (10-50 mPas) (computer translation). JP '889 does not specifically disclose polyvinylpyrrolidone as the binder.

Loria et al. teach that for ink jet compositions for printing on substrates to be subjected to high temperatures after being printed, such as ceramic articles, the ink jet composition comprises a carrier solvent and a binder resin to add adhesion of the ink droplet to the substrate. The binder resin is organic resin commonly used in ink jet printer ink compositions and include acrylic copolymers, silicone resins, rosin esters, polyvinyl esters, ketone resin, polyamide resin, polyvinylpyrrolidone resins, vinyl pyrrolidone/vinyl acetate copolymers, etc. (col. 2, lines 14-25, col. 4, lines 20-35).

Zhu teaches that binder resins for aqueous ink jet compositions include organic resin commonly used in ink jet compositions including acrylic copolymers, silicone resins, rosin esters, polyvinyl esters, ketone resin, polyamide resin, polyvinylpyrrolidone resins, vinyl pyrrolidone/vinyl acetate copolymers, etc. (col. 6, lines 22-30).

It would have been obvious to one of ordinary skill in the art to have provided the resin in the ink jet ink used in the method of JP '889 as polyvinylpyrrolidone, as taught by Loria et al. or

Zhu, as a binder resin commonly used in ink jet compositions and, as taught by Loria et al, a binder resin which can be used in ink jet compositions for printing on ceramic substrates to be subjected to high temperatures after being printed. The use of any of the commonly used binder resins such as polyvinylpyrrolidone resins would have been obvious to one of ordinary skill in the art, as taught by Loria et al. or Zhu.

JP '889 discloses providing the ink jet printing ink of viscosity of 10-50 mPas, thus encompassed by the claimed viscosity range of 5-50 mPas at 25 to 35°C.

(4)

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 989 570 in view of either Loria et al. 5,443,628 or Zhu 5,889,083.

EP 0 989 570 (EP '570) discloses a method of producing an electronic component comprising: forming via holes in green sheets; using ink from an ink jet device to fill up the via holes and form electrode patterns on the green sheets; laminating the green sheets by pressing to form a body; and baking (firing). The ink jet printing ink comprises metal powder (conductor functional material) and a resin dispersed in water or organic solvent and has a viscosity of 2 poise or less (col. 2-6, col. 13, lines 4-32) EP '570 discloses using water soluble resin such as polyvinyl alcohol or other vinyl resin for improving the adhesions and strength of the ink after drying but does not specifically disclose polyvinylpyrrolidone as the binder.

Loria et al. teach that for ink jet compositions for printing on substrates to be subjected to high temperatures after being printed, such as ceramic articles, the ink jet composition comprises a carrier solvent and a binder resin to add adhesion of the ink droplet to the substrate. The binder resin is organic resin commonly used in ink jet printer ink compositions and include acrylic

copolymers, silicone resins, rosin esters, polyvinyl esters, ketone resin, polyamide resin, polyvinylpyrrolidone resins, vinyl pyrrolidone/vinyl acetate copolymers, etc. (col. 2, lines 14-25, col. 4, lines 20-35).

Zhu teaches that binder resins for aqueous ink jet compositions include organic resin commonly used in ink jet compositions including acrylic copolymers, silicone resins, rosin esters, polyvinyl esters, ketone resin, polyamide resin, polyvinylpyrrolidone resins, vinyl pyrrolidone/vinyl acetate copolymers, etc. (col. 6, lines 22-30).

It would have been obvious to one of ordinary skill in the art to have modified the method of EP '570 for producing an electronic component by providing the water soluble resin in the ink jet printing ink as polyvinylpyrrolidone, as taught by Loria et al. or Zhu as a binder resin commonly used in ink jet compositions and, as taught by Loria et al, a binder resin which can be used in ink jet compositions for printing on ceramic substrates to be subjected to high temperatures after being printed. The use of any of the commonly used binder resins such as polyvinylpyrrolidone resins would have been obvious to one of ordinary skill in the art, as taught by Loria et al. or Zhu, and as EP '570 discloses using polyvinyl alcohol or other vinyl resin as the resin and polyvinylpyrrolidone resins are vinyl resins.

EP '570 discloses providing the ink jet printing ink of viscosity of 2 poise or less (200 mPas or less), thus encompassing the claimed viscosity range of 5-50 mPas at 25 to 35°C.

Conclusion

(5)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 8-222475 and JP 2000-182889 disclose ink jet printing electrodes on green sheets, laminating and firing. Bishop 6,-13,798 discloses an ink jet composition comprising polyvinyl pyrrolidone as the resin.

(6)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
April 6, 2007